Deepak Cyril D'Souza, M.D.
Professor of Psychiatry
Yale University School of Medicine

Associate Director of Research
Mental Health Care Line
VA Connecticut Healthcare System, 116A
950 Campbell Avenue
West Haven, CT 06516

Phone: (203) 932-5711, ext. 2594
Fax: (203) 937-4860
E-mail: deepak.dsouza@yale.edu

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"Testimony opposed to SB-1085."

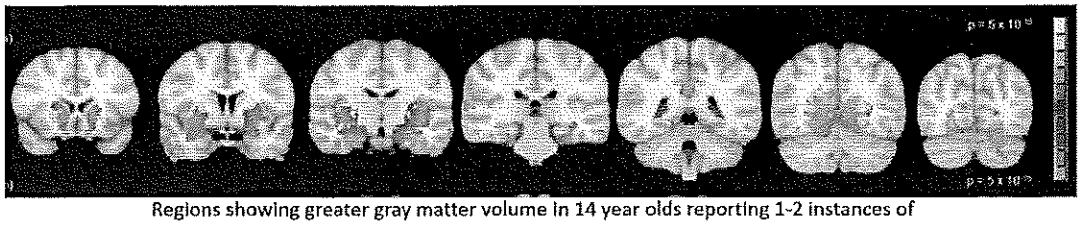
Dear Members of the Judiciary Committee

I am a psychiatrist by training having spent more than 25 years at Yale and VA Connecticut Healthcare System 1) treating people (including veterans) with serious mental illness, 2) teaching trainees, and 3) conducting research on the causes and treatment of psychiatric disorders. For more than 20 years, I have conducted research on cannabis and its constituent cannabinoids, funded by the US National Institute of Health. This research includes studies on the acute effects of cannabinoids in humans, the effects of chronic repeated exposure to cannabis on the human brain. I have also worked on developing new treatments for people who are addicted to cannabis and want to stop. I serve on the Physicians Advisory Board to CT's Medical Marijuana Program. I am also the father of a young person on the brink of adulthood. And finally, I also commute daily to work on I-95. Thus, I am providing testimony from the perspective of a psychiatrist, a researcher, a father, and a driver. I am not representing the Dept. of VA.

I have 4 concerns relevant to the proposed bill: **1) the impact on young people and the developing brain, 2) the anticipated increase in cannabis use disorder, 3) motor vehicle accidents and 4) the negative impact on people with serious mental illness.**

Impact on Young People. Even though the sale of marijuana to kids will be prohibited, we need to look no further than the history of alcohol and tobacco, that there will be a trickle-down effect which could impact an entire generation.

- Acutely, cannabis impairs cognitive processes that are essential to learning and the demands of student life such as attention, memory, processing speed, etc. Regular marijuana use may also have long lasting effects on these cognitive processes, that may or may not recover with abstinence.
- Brain development (particularly the pre-frontal cortex, which is involved in decision making) continues into the early to mid-twenties. The brain's own endocannabinoid system is involved in brain development, and therefore, perturbation of the endocannabinoid system by exposure to cannabis/marijuana can alter brain development. There is a suggestion, which warrants further research, that some of these changes may not be reversible.
- There is accumulating evidence that exposure to cannabis in adolescence may be associated with several impairments. This has been robustly demonstrated in animal experiments.
- In a study published in January by my colleagues, just 1-2 instances of cannabis use in adolescence was associated with structural brain and cognitive effects in adolescents.



Regions showing greater gray matter volume in 14 year olds reporting 1-2 instances of cannabis use vs. matched controls. *Orr et al., J of Neuroscience January 2019*

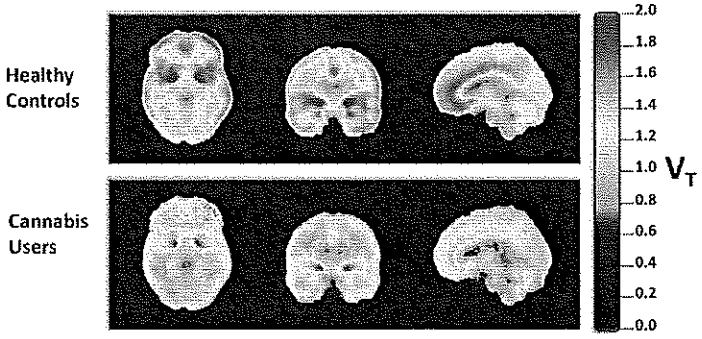
- The young brain is more vulnerable to addiction of all kinds including cannabis.
- Early use of cannabis increases the potential for developing addiction to cannabis, and other drugs.
- The highest rates of cannabis use amongst youth are in States where cannabis is legal.
- Adolescent exposure to cannabis in vulnerable individuals confers a higher risk for schizophrenia, the most serious of mental illnesses that is associated with enormous indirect and direct costs to society.

Thus, setting a minimum age is a good idea. However, based on the above, it would be prudent to set the minimum age to 25 years instead of 21 years.

Cannabis is addictive, and the retail sale of cannabis is bound to lead to an increase in people who develop cannabis use disorder. Unfortunately, there is misconception that marijuana is not addictive or that people cannot become addicted to marijuana. There is no question that marijuana is addictive! There is a common definition of addiction that can be applied to a range of addictive substances; chronically.

- People who develop cannabis use disorder will spend too much time or money acquiring, using, or recovering from its effects; will make many failed attempts to quit or reduce use; and will use it in contexts that are potentially dangerous (e.g., driving), etc –behaviors associated with other drugs of abuse.
- In the most recent, and largest study to date, nearly 3 of 10 daily cannabis users (~30%) manifested a cannabis use disorder in 2012-2013 (see Hasin et al., *JAMA Psychiatry.* 2015;72(12):1235-1242. The prevalence of cannabis use more than doubled between 2001-2002 and 2012-2013, and there was a large increase in cannabis use disorders during that time.
- Daily cannabis users show brain changes consistent with tolerance, an important aspect of addiction– as evidenced by 15% reduction in brain cannabinoid receptors (D'Souza et al., 2016).
- The goal of commercialization is to sell as much product. With that comes the risk of problematic use.
- Even though, like cannabis, tobacco and alcohol have been used by humans for centuries, the commercialization of tobacco and alcohol was a game changer! The morbidity and mortality associated with tobacco and alcohol rank amongst the top 10 in terms of global disease burden. Despite knowing the harmful effects of tobacco it remains widely available.

15% Lower Brain Cannabinoid Receptors in Cannabis Users



- CO is the top state with highest rate of 1st time cannabis users, and its rate of 1st time users has > doubled in the last decade.
- In states where cannabis is legal, regular teen cannabis use is 30% higher than the U.S. rate. CO is the top state with highest rate of 1st time cannabis users, and its rate of 1st time users has > doubled in the last decade.

The public demand for treatment for cannabis addiction is expected to grow. However, there are no approved or proven treatments for cannabis use disorder. **How will treat those seeking help for cannabis use disorder and who will pay for it?**

Cannabis has a negative impact on driving. There is no question that cannabis impairs driving.

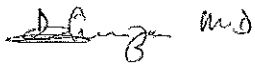
- Experiments testing the effects of cannabis on basic skills (e.g., attention) used in driving; 2) driving simulator studies testing cannabis effects on driving car simulators; and 3) field studies, exploring the degree to which cannabis use is responsible for MVAs all provide complementary evidence that cannabis impairs driving. The rates of driving under the influence of cannabis have increased.
- Cannabis use is associated with higher rates of motor vehicle accidents and mortality.
- Young drivers who are already at high risk for driving related problems, may be at even greater risk with cannabis use.
- Our law enforcement colleagues don't have the tools as yet to test people for cannabis intoxication in the field and we do not have an objective biological roadside test equivalent to a breathalyzer to document intoxication.
- Even though proposed legislation will forbid people from driving under the influence of cannabis, we know quite well from our experience with alcohol, that it continues to happen.
- In Canada, estimated cannabis related collision costs ranged from $1.09 to $1.28 **billion** Canadian $ in 2012.
- **Finally, how will we pay for the direct and indirect costs of motor vehicle accidents in CT?**

Cannabis has a negative impact on the emergence and expression of mental illness. I am a psychiatrist and have worked for more than 25 years treating people with serious mental illness.

- As many of you may have heard in the news over the last few days, yet another study (published in the prestigious journal Lancet Psychiatry) reported a link between cannabis use and psychosis – one of the most serious of mental illnesses.
- Cannabis use in people with schizophrenia and bipolar disorder predicts adverse outcome, including higher relapse rates, longer hospital admissions, and more severe psychotic symptoms in people with schizophrenia (see Schoeler *The Lancet Psychiatry* 3.3 2016: 215-225).
- The cost of treating people with schizophrenia and serious mental illnesses is substantial both in terms of direct (hospitalizations) and indirect (disability benefits) to the state.
- I have already seen bad outcomes with people who have serious mental illness using marijuana after procuring it from the medical marijuana program. Common sense would suggest that with legalization, individuals with serious mental illness would likewise have greater access to cannabis, and we should expect negative consequences.

Who and how will we pay for the costs related to the negative consequences on individuals with serious mental illness at a time when resources for mental health treatment are shrinking?

Sincerely,



D. Cyril D'Souza, MD